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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/779,885	02/17/2004	Hans Thomann	PM 2000.010A/4	9638

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EXAMINER	
TAYLOR, VICTOR J	

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/779,885	THOMANN ET AL.	
	Examiner	Art Unit	
	Victor J. Taylor	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Office Action*.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claimed processing steps of computing a frequency dependent characteristic with the steps of using this characteristic to estimate the formation property of the formation must be shown in a new block and level diagram or flow chart or similar drawing with the necessary changes to the specification must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. Figures 1 to 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. For example, Figure 1 is prior art to Figure 1 of the laboratory data of O'Hara 1989 and is incorporated on page 16 of the specifications, similarly Figure 2 is prior art to Figure 1D of O'Hara 1989, and Figure 3 is prior art to figure 3 of O'Hara 1989. Figure 4 is prior art to Figure 4 of the laboratory data of Christensen and Wang 1985 and incorporated in lines 24-29 on page 14 and in page 18 of the specification. See MPEP § 608.02(g). Corrections are required.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because it is in improper format and does not meet the requirements required in MPEP 608.01 (b). The abstract at most comprises two lines and does not clearly describe the invention in the instant application. A new or corrected abstract is required. Correction is required. See MPEP § 608.01 (b).

4. The disclosure is objected to because of the following informalities: Page one of the specifications is required to show the prior continuations applications. This application is a continuation of 09/973529 abandoned, which is a continuation of 09/6866735 expressed, abandoned. Corrections are required on page and in the declaration. Appropriate correction is required.

Information Disclosure Statement

5. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore unless the examiner on form PTO-892 has cited the references, they have not been considered.

6. The incorporation of essential material in the specification by reference to a foreign application or patent, or to a publication is improper.

For example in the specification the applicant states that one embodiment of the invention as found on page 14 of the specification is a step and a simplification of the detailed data as found in the published literature by O'Hara 1985. Similar references are made to other prior art publications and are found in the specification, for example further references are made to Christensen + Wang 1985 on page 18 in the specifications.

Applicant is required to amend the disclosure to include the material incorporated by reference. The amendment must be accompanied by an affidavit or declaration executed by the applicant, or a practitioner representing the applicant, stating that the amendatory material consists of the same material incorporated by reference in the referencing application. See *In re Hawkins*, 486 F.2d 569, 179 USPQ 157 (CCPA 1973); *In re Hawkins*, 486 F.2d 579, 179 USPQ 163 (CCPA 1973); and *In re Hawkins*, 486 F.2d 577, 179 USPQ 167 (CCPA 1973).

Claim Objections

7. Claims 4, 5, 6, 17, 18, and 19 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 4 further limits claim 3 with the reference to the step of determining frequency dependence that does not exist in claim 3 with a limitation of carrying out the

cross correlation analysis. The antecedent basis for this step is not in claim 3. Claims 5 and 6 depend on claim 4 and are in improper dependent form. Corrections are required.

Claim 17 further limits claim 16 with the reference to the step of determining frequency dependence that does not exist in claim 16 with a limitation of carrying out the frequency component analysis. The antecedent basis for this step is not in claim 16. Claims 18 and 19 depend on claim 17 and are in improper dependent form. Corrections are required.

Oath/Declaration

8. Receipt is acknowledged of papers filed under 35 U.S.C. 119 (a)-(d) based on an application filed in the US for US-09/686,735 on 10/10/2000 that is not applicable to 35 USC 119 (e).

Applicant has not complied with the requirements of 37 CFR 1.63(c), since the oath, declaration or application data sheet does not acknowledge the filing of any foreign application.

A new oath, declaration or application data sheet is required in the body of which the present application should be identified by application number and filing date. Corrections are required that are directed to US 09/973,529 and US 09/686,735 under 35 USC section 120 with the appropriate correction to page one of the specification and to corrections in the oath/declaration.

Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant;

I. Dubinsky et al., US 6,021,377 is cited for the drilling system using the borehole tool BHA 51A in figure 1 in combination with the sensors in lines 1-30 of column 6.

II. Robbins et al., US 5,678,643 is cited for the acoustic logging while drilling using the BHA 65 in figure 1.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-22 are rejected under 35 U.S.C. 102(e) as being anticipated by MacDonald et al., in US 6,206,108.

With regard to claim 1, MacDonald et al., teaches a drilling system with the integrated bottom hole assembly utility bottom hole assemblies containing sensors 782-m and transmitter sources 780-a in figure 9 and discloses the limitations of,

a. "Generating a source signal from a bottom hole assemble" in the drilling system 10 of figure 1 and discloses generating a source signal 792 in figure 9, and discloses the generation of signals 780 on the BHA 90 in lines 38-43 of column 21 and,

b. Further discloses the limitation of "detecting at least one receiver signal using said bottom hole assembly" in the drilling system 10 of figure 1 and discloses receiving a source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and,

c. Further discloses the limitation of "computing a frequency dependent characteristic of said at least one receiver signal" in the drilling system 10 of figure 1 and discloses receiving a source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and discloses computing these formation evaluation sensor signals 912 in the downhole processor 910 to computer the frequency dependent 792 and component 796 in figure 9 and further discloses the look ahead frequency dependent component 816 in figure 10-A and,

d. Further discloses the limitation of "using said frequency dependent characteristic to estimate a property of a formation in the region of said bottom hole assembly in the formation porosity of the BHA parameters processing among other estimated lithological characteristics in lines 30-35 of column 5 using the measurement system of the drilling system 10 of figure 1 and discloses receiving the source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and discloses computing these formation evaluation sensor signals 912 in the downhole processor 910 to computer the frequency dependent 792 component 796 in figure 9 the estimate of the formation property using the look ahead frequency dependent component 816 in figure 10A.

As to claim 2, MacDonald et al., discloses the limitation of the "BHA comprises a drilling apparatus" in the drilling system 10 of figure 1.

As to claim 3, MacDonald et al., discloses the limitation of the "BHA emits a noise spectrum generated by a drill bit of said drilling apparatus" in the drilling system 10 of figure 1 for example see T1 on the drill bit 50 in figure 3B.

As to claim 4, MacDonald et al., discloses the limitation step "of frequency dependence is carried out by cross correlation analysis" in the drilling system 10 of figure 1 using steps in the processing of interactive models 830 in figure 10B.

As to claim 5, MacDonald et al., discloses the limitation of at least one "receiver signal comprises a direct formation signal and formation surrounds said borehole" in the drilling system 10 of figure 1 using the received signal 792 direct from the formation 786 surrounding the borehole 726 in figure 9.

As to claim 6, MacDonald et al., discloses the limitation of at least one "receiver signal is a reflected signal and said formation is ahead of the borehole" in the drilling system 10 of figure 1 using the reflected signal 792 and looking ahead function 795 in the borehole in figure 9.

As to claim 7, MacDonald et al., discloses the limitation of "the frequency dependent characteristic is amplitude modulation" in the drilling system 10 of figure 1 using the formation sensors 912 to detect changes in amplitude of the transmitted signal used to control and process formation characteristics in the processor 910 of figure 11A.

As to claim 8, MacDonald et al., discloses the limitation of "the formation property is pore pressure" in the drilling system 10 of figure 1 using the drilling formation

evaluation sensors 912 and discloses the pore pressure and density measurements in line 35 of column 5.

As to claim 9, MacDonald et al., discloses the limitation of "the pore pressure is estimated from a frequency dependent attenuation relationship" in the drilling system 10 of figure 1 with the adjustable frequency of the source 780 used to determine the formation parameters with the serial processing that is common in current MWD systems and discloses this current MWD for formation porosities lines 1-22 column 19.

As to claim 10, MacDonald et al., discloses the limitation of "the frequency dependent characteristics is wave propagation velocity" in the drilling system 10 of figure 1 and computes the velocity in the model 948 with the processor 940 figure 11B.

As to claim 11, MacDonald et al., discloses the limitation of "the formation property is pore pressure" in the drilling system 10 of figure 1 and in the porosity and density measurements disclosed in lines 1-20 of column 19.

As to claim 12, MacDonald et al., discloses the limitation of "the formation property is lithology" in the drilling system 10 of figure 1 and measurements disclosed in lines 1-20 of column 19.

As to claim 13, MacDonald et al., discloses the limitation of "the formation property is fluid content" in the drilling system 10 of figure 1 and density measurements disclosed in lines 1-20 of column 19.

As to claim 14, MacDonald et al., discloses the limitation of "the formation property is rock strength" in the drilling system 10 of figure 1 and density measurements disclosed in lines 1-20 of column 19.

As to claim 15, MacDonald et al., discloses the limitation of "the tool is a BHA of a measuring while logging system" in the drilling system 10 of figure 1 and disclosed in lines 1-20 of column 19.

As to claim 16, MacDonald et al., discloses the limitation of "the source signal is generated by an active source on said BHA" in the drilling system 10 of figure 1 in the element 51A.

As to claim 17, MacDonald et al., discloses the limitation of the "determining frequency dependence is carried out by a frequency component analysis" in the drilling system 10 of figure 1 with the surface computer 940 in figure 11B.

As to claim 18, MacDonald et al., discloses the limitation of "the one receive signal comprises a direct borehole signal" in the drilling system 10 of figure 1 with direct bed boundary 932 distances in figure 11B.

As to claim 19, MacDonald et al., discloses the limitation of "the formation property is permeability" in the drilling system 10 of figure 1 with the formation sensors 912 in figure 11A.

With regard to claim 20, MacDonald et al., discloses the limitations of

a. "Generating a source signal from a bottom hole assembles" in the drilling system 10 of figure 1 and discloses generating a source signal 792 in figure 9, and discloses the generation of signals 780 on the BHA 90 in lines 38-43 of column 21 and,

b. Further discloses the limitation of "detecting at least one receiver signal using said bottom hole assembly" in the drilling system 10 of figure 1 and discloses receiving

a source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and,

c. Further discloses the limitation of "using said source and receiver signal to estimate a pore pressure of a formation" in the formation porosity of the BHA parameters among other lithological characteristics in lines 30-35 of column 5 in combination with the measurement system of the drilling system 10 of figure 1 and discloses receiving a source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and,

d. Further discloses the limitation "of repeating steps a), b), c), as said BHA moves sequentially downward through said formations" in the BHA 90 in figure 1 in combination with the drilling and the downhole processor 910 in figure 11A.

With regard to claim 21, MacDonald et al., discloses the limitation of

a. "Generating a source signal from a bottom hole assembles" in the drilling system 10 of figure 1 and discloses generating a source signal 792 in figure 9, and discloses the generation of signals 780 on the BHA 90 in lines 38-43 of column 21 and,

b. Further discloses the limitation of "detecting at least one receiver signal using said bottom hole assembly" in the drilling system 10 of figure 1 and discloses receiving a source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and,

c. Further discloses the limitation of "using said source signal and receiver signal to determine a pore pressure of a formation" in the formation porosity of the BHA parameters among other lithological characteristics in lines 30-35 of column 5 in

combination with the measurement system of the drilling system 10 of figure 1 and discloses receiving a source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and,

d. Further discloses the limitation of using "the pore pressure to monitor the wellbore pressure safety margin" in the drilling system 10 of figure 1 in combination with formation evaluation 912 to selective operate the drilling operation 913 figure 11A and,

e. Further discloses the limitation of "repeating steps a), b), c), d), as said BHA moves sequentially downward through said formations" in the BHA 90 in figure 1 in combination with the drilling and the downhole processor 910 in figure 11A.

With regard to claim 22, MacDonald et al., discloses the limitations of

a. "Generating a source signal from a bottom hole assembles" in the drilling system 10 of figure 1 and discloses generating a source signal 792 in figure 9, and discloses the generation of signals 780 on the BHA 90 in lines 38-43 of column 21 and,

b. Further discloses the limitation of "detecting at least one receiver signal using said bottom hole assembly" in the drilling system 10 of figure 1 and discloses receiving a source signal 792 in figure 9, and discloses the receiving of signals 782 on the BHA 90 in lines 38-43 of column 21 and,

c. Further discloses the limitation of "using said source signal and receiver signal to determine a pore pressure of a formation ahead of the BHA" in the formation porosity of the BHA parameters among other lithological characteristics in lines 30-35 of column 5 in combination with the measurement system of the drilling system 10 of figure 1 and discloses receiving a source signal 792 in figure 9, and discloses the receiving of

signals 782 on the BHA 90 in lines 38-43 of column 21 and discloses the look ahead frequency dependent component 816 in figure 10A and,

d. Further discloses the limitation of using "the pore pressure to specify a weight of drilling mud corresponding to a target wellbore pressure safety margin" in the drilling system 10 of figure 1 and discloses adjusting the drilling fluid using the drilling sensor data 820 to control the drilling parameters 956 and operate the drilling with in safe parameters 913 of figure 11A with the fluid parameters of the drilling fluid in lines 35-40 of column 5 in combination with the measurement system of the drilling system 10 of figure 1. Here the drilling fluid is the drilling mud and is disclosed as the weight of the viscosity, the density weight and the chemical composition in lines 43-50 of column 5 which comprises the chemical drilling mud weight density.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 571-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VJT

14 September 2004

John Barlow
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